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IN REPLY REFER TO:
1-1-98-F-139

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
3310 El Camino Avenue, Suite 130
Sacramento, California 95821-6340

March 22, 1999

Mr. Jeffrey A. Lindley
Division Administrator
Federal Highway Administration, California Division
980 Ninth Street, Suite 400
Sacramento, California 95814-2724

Subject: Endangered Species Formal Consultation on the Proposed Corridor for
State Route 58 between State Route 99 and Interstate 5, Kern County,
California

Dear Mr. Lindley:

This is in response to your request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed corridor for State Route 58 between State Route 99 and Interstate 5 in Kern County, California. This document represents the Service's biological opinion (Opinion) on the effects of the proposed action on the following federally-listed animal species:

San Joaquin kit fox, *Vulpes macrotis mutica*, (endangered)
Tipton kangaroo rat, *Dipodomys nitratooides nitratooides*, (endangered)
California condor, *Gymnogyps californianus*, (endangered)
Least Bell's vireo, *Vireo bellii pusillus*, (endangered)
blunt-nosed leopard lizard, *Gambelia silus*, (endangered)

and the following federally-listed plant species:

Hoover's eriastrum (also woolly-star), *Eriastrum hooveri*, (threatened)
California jewelflower, *Caulanthus californicus*, (endangered)
Kern mallow, *Eremalche kernensis*, (endangered)
San Joaquin woolly-threads, *Lembertia congdonii*, (endangered) and
Bakersfield cactus, *Opuntia basilaris treleasei*, (endangered)

in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act).

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Per your request, the Service has considered the information you provided about the other endangered, threatened, and proposed species on the lists provided by the Service on September 20, 1996 and March 24, 1998. On the basis of that information, the Service concurs that this project is not likely to adversely affect the following species:

giant kangaroo rat, *Dipodomys ingens*, (endangered)
 Aleutian Canada goose, *Branta canadensis leucopareia* (threatened)
 American peregrine falcon, *Falco peregrinus anatum* (endangered)
 bald eagle, *Haliaeetus leucocephalus* (threatened)
 giant garter snake, *Thamnophis gigas* (threatened)
 California red-legged frog, *Rana aurora draytonii* (threatened)
 Delta smelt, *Hypomesus transpacificus* (threatened)
 Sacramento splittail, *Pogonichthys macrolepidotus* (proposed threatened)
 valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (threatened)
 vernal pool tadpole shrimp, *Lepidurus packardii*, (threatened)
 vernal pool fairy shrimp, *Branchinecta lynchi*, (threatened)
 Conservancy fairy shrimp, *Branchinecta conservatio*, (endangered)
 longhorn fairy shrimp, *Branchinecta longiantenna*, (endangered)
 San Joaquin adobe sunburst, *Pseudobahia peirsonii*, (threatened)
 Greenhorn adobe-lily, *Fritillaria striata*, (Species of Concern)

Therefore, for these species, unless new information indicates that the action will affect them in a way not considered, no further consultation under the Act is necessary. If new information comes to light that indicates the action may affect them, please contact us immediately.

This Opinion is based on information provided in the July 1998, *Biological Assessment*, which was received, with your request for consultation, on July 20, 1998; and the *Draft Tier I Environmental Impact Statement/Environmental Impact Report (DEIS/DEIR)* signed November 4, 1997; meetings on March 4 and July 8, 1998; the letter from the California Department of Transportation dated July 6, 1998; various telephone conversations; and other sources of information. A complete administrative record of this consultation is on file in this office.

Consultation History

The State Route 58 Alignment project has been in development since 1991. Resource conservation issues that have been discussed between California Department of Transportation (Caltrans) and the Service include: developing a programmatic section 7 consultation to address multiple Caltrans projects in the San Joaquin Valley, effects on habitat conservation lands (Kern Water Bank), crossing the Kern River, wetlands, growth inducing effects, and San Joaquin kit fox corridors. Resource agencies involved include: the Army Corps of Engineers (Corps), California Department of Fish and Game (CDFG), and the Wetlands Branch and Endangered Species Division of the Service. The Corps File Number is 199400457.

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Ten alternative alignments initially were considered for State Route 58 between State Route 99 and Interstate 5. All but one have been rejected because they do not meet the transportation needs of the region, impacts to archaeological sites were too numerous, or impacts to already developed property were unacceptable.

Limited surveys were done to determine potential locations of sensitive resources. This included cultural and biological resources. Plant and animal surveys of the proposed corridor and buffer zone identified locations of potential or known San Joaquin kit fox dens, burrowing owl burrows, and occurrences of Hoover's eriastrum, Kern mallow, San Joaquin bluecurls (*Trichostema ovatum*) (on the California Native Plant Society watch list) and recurved larkspur (*Delphinium recurvatum*), a species of concern.

Caltrans began coordination with regulatory agencies on issues concerning jurisdictional wetlands and water with a meeting in February 1994 with the Corps and the U.S. Environmental Protection Agency (EPA). Caltrans participated in a 404 permit preapplication meeting on May 5, 1994 with the Corps, EPA, Federal Highway Administration (FHWA), CDFG, and the Service. In a letter dated May 23, 1994, the FHWA requested that the Service become a cooperating agency in the development of the DEIS/EIR and participate in the coordination process as outlined in the Memorandum of Understanding (MOU) among the FHWA, Caltrans, and the Service. On June 28, 1997, the Service agreed to participate in preparation of the DEIS/EIR as a cooperating agency and provide comments in accordance with the MOU.

Prior to circulation of the DEIS/EIR the Cross Valley Canal Option (of the Kern River alignment), a route that avoids impacts to all jurisdictional wetlands, was identified. Upon notification of this alternative, the Corps confirmed that a Nationwide Permit #14 would likely be required prior to project construction, and the NEPA/404 coordination process would not be applicable to the Cross Valley Canal Option (Corps 1997). The Department of the Interior provided comments on the DEIS/EIR on February 12, 1998 (Interior 1998).

The Service consulted with Caltrans about other projects in 1996 and suggested that effects on endangered species in the San Joaquin Valley be addressed in a formal programmatic consultation to meet the requirements as described in *Conner v. Burford*, 848 F.2d 1441 (9th Cir. 1988) court ruling. The Service first recommended the formal programmatic consultation in its biological opinion of September 19, 1996 on a proposed project to repave and widen a portion of State Route 46, between Route 33 and Route 5, in Kern County, California (Service File No. 1-1-96-F-85).

A request for an extension for delivery of the Biological Opinion to December 31, 1998 from November 30, 1998 was made by the Service by letter dated November 30, 1998 to the FHWA. The Kern River alignment, which intersected Interstate 5 north of Stockdale Highway, was removed from consideration by Caltrans on December 7, 1998. The Kern River alignment, with the Cross Valley Canal Option, which intersects Interstate 5 south of Stockdale Highway, is the

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only alignment that Caltrans is now considering for the project (York personal communication 1998).

BIOLOGICAL OPINION

Description of the Proposed Action

The project as developed by Caltrans and the FHWA is to adopt an east-west transportation corridor for State Route 58 (Figure 1) that will:

- 1) provide continuity for State Route 58 in Kern County and
- 2) provide an alignment for future multi-modal transportation facilities that reduces congestion on the transportation network in the western Bakersfield metropolitan area (Caltrans 1998).

The Act's implementing regulations require that the Service address the entire scope of the project, to the extent possible, not just acquisition of a right-of-way. Acquisition of a right-of-way is an irretrievable commitment of funds and the construction of the highway is interrelated and interdependent with acquisition of the right-of-way, as explained in our comments on the DEIS/EIR (Service 1998c). This Biological Opinion addresses build out of the road as much as possible at this stage in the design process, as well as the adoption of a highway alignment.

The proposed project addresses a 16.9 mile section of the highway in Kern County, as shown on Figure 2. From west to east, the segment of Route 58 addressed by this project presently consists of a two-lane conventional highway from Interstate 5 to Allen Road, a four-lane conventional highway from Allen Road to Camino Del Rio Court, and a short six-lane segment between Camino Del Rio Court and Route 99. The existing transportation system in the project area is shown on Figure 3.

The Selected Alternative

The Cross Valley Canal Option is the selected route identified through the DEIS/DEIR process (Caltrans 1997; York personal communication 1998). This alignment begins at Interstate 5, north of the Cross Valley Canal, approximately two miles south of the Stockdale Highway interchange. It parallels the canal in a northeasterly direction to Enos Lane. It then shifts to the south, running parallel to the Cross Valley Canal east to Nord Road. At this point, the alignment bends northward through an urban area east of Heath Road and then crosses the Kern River just west of the existing railroad bridge and runs east, terminating at Route 99 near the present Route 99 overcrossing of Truxton Avenue. Six interchanges are envisioned with the following roads: Enos Lane (Route 43), Nord Road, Allen Road, the vicinity of Calloway Drive, Coffee Road, and Mohawk Street.

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The proposed freeway will connect on the eastern end of the project directly to the Route 58 East freeway by ramps running parallel to Route 99. Ramps would also be provided for southbound traffic on Route 99 to access the Route 58 freeways to the east and west without interfering with traffic exiting or accessing Route 99 from Rosedale Highway and California Avenue.

For purposes of preserving sufficient right-of-way to meet long-term (i.e., 20-year) transportation needs, the alignment will be 300 feet wide. This width provides flexibility in the design of future transportation facilities because it is wide enough to accommodate an eight-lane freeway and a median that could be used for additional lanes or other transportation facilities such as High Occupancy Vehicle (HOV) lanes, busways, and rail up to Route 99. All construction activities will occur within the 300-foot width. Access for construction vehicles will be from the six proposed interchanges with existing north-south roads.

Schedule

Development of a new transportation facility for Route 58 will be accomplished in phases commencing within a few years and concluding as much as 50 years from now. The time line for each phase depends on traffic demand, transit service strategies, operational management strategies, and funding. Predicted future traffic demand indicates the need for additional transportation facilities over the next 20 years. Following route adoption, the right-of-way can be protected by acquisition of property and implementation of local land use controls.

A schedule for buying land and building the freeway has not been determined because the project will be developed, in part, with state funds as they are appropriated by the legislature. The *Metropolitan Bakersfield 2010 General Plan* (City of Bakersfield 1990) describes the need for a Westside Freeway, and estimates that by 2010 the freeway will be completed between Renfro Road and Route 99, approximately half the project described here. Renfro Road is five miles east of Enos Lane; the western boundary of the Metropolitan Bakersfield planning area is a quarter mile west of Enos Lane. The road will likely be built in segments bounded by the six interchanges proposed in the project, starting in the east and moving to the west as needed.

Consistency with Local Planning Efforts

The *General Plan* is based on the population growing from 286,000 people in 1987 to 567,000 people in 2010 in the Bakersfield metropolitan area. This is the highest population estimate provided by the City and County's consultant. Since the high estimate is used for the basis of land use and transportation planning, and will accommodate all of the growth based on that estimate, it is obvious that City and County policy is to not limit growth at this time.

The *General Plan* delineates roads and intersections that are presently suffering congestion, as shown on Figure 4. Congestion occurs on Rosedale Highway in the vicinity of Route 99, on Gosford Road where it crosses the Kern River, between Rosedale Highway and California Avenue to the east of Route 99 on Oak Street, and on Route 99 between Rosedale Highway and

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California Avenue. The easternmost segment of the proposed project would alleviate some or all of the congestion near Route 99 just described. The *General Plan* delineates proposed highways, including an east-west road in the northwest sector that mirrors the proposed project, and a north-south highway to the west of Bakersfield at about Allen Road, as shown on Figure 5.

The *General Plan* proposes to direct and concentrate growth toward higher density mixed use centers in order to reduce vehicle use and encourage pedestrian traffic in Bakersfield, as shown on Figure 6. Three higher density mixed use centers are proposed for the periphery of urban Bakersfield, including one in the northwest, near Allen Road and Rosedale Highway.

Accommodations for Sensitive Species

Direct impacts to habitat are estimated based on the assumption that a future transportation facility will make the entire corridor unavailable to special status plants and animals. The land area directly affected by the project was estimated by habitat type from aerial photographs, engineering alignment maps, and field reconnaissance. Conservation acreage will be set aside incrementally as each segment of the road is built. The amount of conservation acreage has been estimated here, but may change because construction plans are conceptual at this phase in the project. Conservation acreage amounts will be defined in the Tier II environmental documents for a specific future project, following the approach described here. A summary of potential impacts and proposed species conservation concepts is presented in Table 1. Only those measures that apply to the Cross Valley Canal Option are of interest.

Direct impacts to non-riparian habitat will be compensated for by acquiring and enhancing similar habitat prior to construction of any future transportation facilities. Impacts to grasslands will be compensated for by acquiring grassland at a 3:1 ratio (3 acres preserved for every one acre destroyed) or valley saltbush scrub, alkali sink scrub, Great Valley mesquite scrub, and/or Valley sacaton grassland at a 1:1 ratio. Impacts to agricultural land and recharge basins will be compensated for by acquiring retired agricultural land at a 1:1 ratio, or acquiring land vegetated with the higher value habitats just mentioned at a ratio of 0.5 :1.

Lands acquired for species conservation will be enhanced or restored by implementing the following measures adapted from the *Recovery Plan for Upland Species of the San Joaquin Valley, California (Recovery Plan)* (Service 1998d):

- constructing artificial dens for kit foxes
- installing fencing to prevent vehicle encroachment and manage grazing animals
- seeding native barley, and other native plants of the San Joaquin Valley, to minimize establishment of non-native, invasive weeds, reduce soil erosion, and provide food and cover for small animals that are prey for foxes and raptors

A management plan will be developed for all acquired lands that includes goals and objectives, potential for enhancement, monitoring, vegetation management, and fire management. Lands are

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proposed to be acquired by Caltrans on or near existing ecological preserves near the project area. Possibilities at this time include the Semitropic Ridge Preserve, the Coles Levee Ecosystem Preserve, and the Lokern Conservation and Management Area. Caltrans and the FHWA have not specifically mentioned protecting this land in perpetuity, or provided a fund for management of the land.

Conservation Measures for Impacts to Riparian Species. Riparian impacts on the east end of the project at the Kern River will be compensated for by enhancement and/or restoration of 0.2 acre of Great Valley cottonwood riparian forest (a 1:1 ratio) adjacent to the proposed alignment. Conservation measures will consist of constructing levee setbacks, 10-foot-wide low terraces adjacent to the channel, and planting riparian trees and shrubs on the terrace and banks. The low terrace would be constructed at an elevation that would be inundated and saturated at a sufficient frequency and duration to support riparian tree species. Banks would also be planted with riparian plant species. Proposed species are presented on Table 2 of the Biological Assessment (Caltrans 1998). All species are native to local riparian plant communities and include understory shrubs and herbaceous species as well as trees to encourage creation of a balanced riparian habitat. Planting would take place in the early spring at the end of the rainy season. Trees and shrubs would be planted from 'deepot' containers (2.5-inch by 9-inch plastic tubes) to promote rapid root growth. Tree shelters and/or shrub shelters will be used to protect plantings from herbivory. All riparian plantings will be irrigated as needed during the first two years or until monitoring shows that it has become established. Monitoring will continue for a minimum of five years. A specific conservation program for riparian vegetation will be developed in consultation with the California Department of Fish and Game. The conservation program will include:

- Preparation of plans and guidelines for site preparation, planting and irrigation specifications, plant species and planting methodologies, performance criteria, and maintenance and monitoring requirements and procedures.
- Seeds, rooted cuttings, and container plants specified in the plan would be obtained from suppliers and contract growers of native plants, with special consideration given to obtaining plants from the local genetic stock. Advance notice of 9 to 12 months will be required for the supplier/grower to ensure that the required species are ready at the time of proposed planting.
- The conservation site will be monitored by a qualified biologist or horticulturist with appropriate credentials and experience in native habitat restoration. Construction impacts will be avoided or minimized by installing protective fencing around preserved riparian vegetation to prevent damage during construction activities.

Conservation Measures for Impacts to Upland Species. The selected alternative (the Cross Valley Canal Option) will impact 544 acres of upland habitat that can support San Joaquin kit fox. This includes 85 acres of grassland and 459 acres of agricultural land. The grassland can

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also support other upland species. Approximately 52 acres of the agricultural land at the western terminus of this alignment has recently been developed as recharge basins by the Kern Water Bank Authority but this area is included in the 459 acres of agricultural land potentially affected by this alignment.

The potential for disruption of kit fox corridors depends on the design and location of the proposed project. The proposed alignment will begin at Route 99 and extend west through a fully developed industrial area crossing over Truxton Avenue, Kern River Parkway, Burlington Northern Santa Fe Railroad, and the Cross Valley Canal on the north side of the Kern River. Route 58 will be elevated in this area and will not block kit fox travel corridors along the river and railroads except during construction.

North of the Kern River the proposed Route 58 alignment will be slightly elevated until it reaches the bridges necessary to span the Friant-Kern Canal and Coffee Road. To insure north-south movement of kit foxes to and from undeveloped industrial properties near Mohawk Street, three 2-foot-diameter culverts will be placed underneath the facility at critical locations. These locations are to be determined by a biologist working with local experts and the resource agencies. Brian Cypher, kit fox expert and former head of the Endangered Species and Archeology Program at the Naval Petroleum Reserve, recommended culverts of this size because they are more likely to be used as corridors instead of places to den. Corridors at the Friant-Kern Canal and Coffee Road will not be obstructed (Caltrans 1998).

Between Coffee Road and Calloway Drive, the alignment will be slightly elevated. According to Brian Cypher there are no north-south kit fox corridors in this region, and therefore no culverts or other accommodations for kit fox are planned at this time (Caltrans 1998).

Between Calloway Drive and Route 43 (Enos Lane) no accommodations for kit fox travel corridors are planned.

West of Route 43 (Enos Lane) the proposed freeway parallels the Cross Valley Canal as it turns to the southwest to connect with Interstate 5. The land is owned by the Kern Water Bank Authority and is subject to a Habitat Conservation Plan (HCP) approved by the Service. This area is being used for recharge basins and upland wildlife corridors. The construction design of the proposed facility includes ten 2-foot-diameter culverts evenly distributed along this portion of the facility.

Avoidance of Construction-related Impacts. Impacts to special status species during construction will be avoided by implementing the following general measures as necessary:

- An environmental awareness training program will be required for construction personnel before construction begins. The program will provide workers with information on their responsibilities with regard to sensitive species including locations of environmentally

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sensitive areas, exclusion zones, timing constraints, and communication with biological resource monitors.

- Conduct preconstruction surveys to identify active breeding or nesting sites.
- Schedule construction to avoid breeding or nesting periods for special status species to the extent possible.
- Designate and avoid environmentally sensitive areas by fencing and monitoring.
- Modify construction easements, access routes, and staging areas to avoid sensitive areas.
- Monitor during all activities related to construction.

A project-specific conservation plan will be developed to address construction-related special status species impacts. The conservation plan will emphasize avoidance and minimization of impacts to plant populations previously described.

Caltrans plans to implement specific measures to reduce impacts to San Joaquin kit foxes, Tipton kangaroo rats, blunt-nosed leopard lizards, Swainson's hawks, and burrowing owls. Those measures for protection of the federally-protected species - San Joaquin kit fox, Tipton kangaroo rat, and blunt-nosed leopard lizard - are summarized here.

San Joaquin Kit Fox. Surveys will be conducted 2 years prior to construction to identify active dens in the project area. Caltrans will mitigate for kit fox dens that cannot be avoided by following the kit fox provisions and constructing artificial dens in locations that are mutually agreeable to Caltrans and the Service.

No less than 60 days prior to beginning construction, additional preconstruction surveys will be conducted to determine if active dens are present in the project area. If active dens are present, Caltrans will establish exclusion zones around the den site and no work shall be permitted within 150 feet during the pupping period (January 1 to June 14). During the non-pupping period, all potential San Joaquin kit fox dens within a project work area shall be hand-excavated under the direct supervision of a qualified biologist. If at any time during excavations, a San Joaquin kit fox is encountered, excavation shall cease and the animal shall be allowed to escape uninjured.

Tipton Kangaroo Rat and Blunt-nosed Leopard Lizard. Caltrans will implement the following measures to minimize impacts to Tipton kangaroo rats and blunt-nosed leopard lizards:

- A biological monitor shall be present during all ground-disturbing construction activities

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If individual Tipton kangaroo rats or blunt-nosed leopard lizards are discovered within the project work area during construction, Caltrans shall relocate these individuals according to Service and CDFG protocols.

Status of the Species

The entire range of the species being addressed in this Opinion is described, as it was known historically, and as it occurs today. The major threats to the species are noted. The reader is directed to the *Recovery Plan* (Service 1998d) for further information on taxonomy, ecology, and biology of the species described here. Federally threatened and endangered animals are addressed first, with species accounts for plants presented second.

San Joaquin Kit Fox (*Vulpes macrotis mutica*)

Species Description and Life History. The San Joaquin kit fox was federally listed as endangered on March 11, 1967 (32 FR 4001) and State listed as threatened in 1971. The San Joaquin kit fox is a small canid, with an average body length of 20 inches and weighing about 5 pounds. They are lightly built, with long legs and large ears. Pelage color ranges from tan to buffy gray in the summer to silvery gray in the winter. The belly is whitish and the tail is black-tipped.

The diet of kit foxes varies geographically, seasonally and annually, based on temporal and spatial variation in abundance of potential prey. In the southern portion of their range, kangaroo rats (*Dipodomys* spp.), pocket mice (*Perognathus* spp.), white-footed mice (*Peromyscus* spp.), and other nocturnal rodents comprise about one-third or more of their diets. Kit foxes also prey on California ground squirrels (*Spermophilus beecheyi*), black-tailed hares (*Lepus californicus*), San Joaquin antelope squirrels (*Ammospermophilus nelsoni*), desert cottontails (*Sylvilagus audubonii*), ground-nesting birds, and insects. Dens are used by the fox for temperature regulation, shelter from adverse environmental conditions, and escape from predators. Kit foxes excavate their own dens, use those constructed by other animals, and use human-made structures (culverts, abandoned pipelines, and banks in sumps or roadbeds). Kit foxes often change dens and many dens may be used throughout the year. However, evidence that a den is being used by kit foxes may be absent. Kit foxes are subject to competitive exclusion or predation by other species, such as the nonnative red fox (*Vulpes vulpes*), coyote (*Canis latrans*), domestic dog (*Canis familiaris*), bobcat (*Felis rufus*), and large raptors.

Historical and Current Distribution. The current range of the San Joaquin kit fox is divided into two areas, the northern range centering around Contra Costa County, and the southern range in the San Joaquin Valley and neighboring valleys. In the San Joaquin Valley before 1930, the San Joaquin kit fox occurred within an 8,700-square mile range in central California from the vicinity of Tracy in the upper San Joaquin Valley on the west side, and near La Grange, Stanislaus County, on the east side, south to the general vicinity of Bakersfield. Historically, San Joaquin kit foxes occurred in several San Joaquin Valley native plant communities. In the southernmost portion of the range, these communities included Valley Sink Scrub, Valley Saltbush Scrub,

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Upper Sonoran Subshrub Scrub, and Annual Grassland. By 1930, the kit fox southern range had been reduced by more than half, with the largest portion remaining in the southern and western parts of the Valley. By 1958, an estimated 50% of the Valley's original natural communities had been lost, due to extensive land conversions, intensive land uses, and the use of pesticides. In 1979, only about 6.7% of the San Joaquin Valley's original wildlands south of Stanislaus County remained untilled and undeveloped. Today many of these communities are represented only by small, degraded remnants. Kit foxes are, however, found in grassland and scrubland communities, which have been extensively modified by humans with oil exploration, wind turbines, agricultural practices, and/or grazing. The population is fragmented, particularly in the northern part of the range.

Kit foxes currently are limited to remaining grassland, saltbush, open woodland, alkali sink valley floor habitats, and other similar habitats located along bordering foothills and adjacent valleys and plains. The largest extant populations of kit foxes are in the Elk Hills and the Buena Vista Naval Petroleum Reserve, and the Carrizo Plain Natural Area in San Luis Obispo County. The natural lands of western Kern County, including the Naval Petroleum Reserve, Elk Hills, the Lokern Area, and adjacent natural land inhabited by kit foxes are essential for kit fox recovery. In the southern San Joaquin Valley they appear to make extensive use of habitat fragments in an urbanizing environment (Service 1998d).

Reasons for Decline. Intensive agriculture, urbanization, and other land-modifying actions have eliminated extensive portions of habitat and are the most significant causes of this species endangerment. Such habitat losses contribute to kit fox declines through displacement, direct and indirect mortalities, barriers to movement, and reduction of prey populations. The coyote and the introduced red fox compete for food resources with the smaller kit fox, and are known to prey upon kit fox as well (DOE and Chevron 1998). Predation, competition, poisoning, and vehicle strikes contribute substantially to the vulnerability of this species.

Recovery Actions. A recovery plan approved in 1983 proposed interim objectives of halting the decline of the San Joaquin kit fox and increasing population sizes above 1981 levels (Service 1983). In 1998, a recovery plan for San Joaquin Valley upland terrestrial species was finalized which includes a revised recovery plan for the kit fox (Service 1998d). This plan calls for protecting the Carrizo Plain, western Kern County, and the Ciervo-Panoche Natural Area as core populations while reducing their isolation by managing populations on connecting private and public lands through conservation agreements.

Tipton Kangaroo Rat (*Dipodomys nitratoides nitratoides*)

Species Description and Life History. The Tipton kangaroo rat was federally listed as endangered on July 8, 1988 (53 FR 25608), and state listed as endangered in 1989. The Tipton kangaroo rat is one of three subspecies of the San Joaquin kangaroo rat. Adult Tipton kangaroo rats weigh about 35 to 38 grams, have a head and body length of about 100 to 110 millimeters and a tail

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about 125 to 130 millimeters in length. Adaptations for two-footed or bipedal hopping include elongated hind limbs, a long, tufted tail for balance, a shortened neck, and a large, flattened head.

Tipton kangaroo rats eat mostly seeds, with small amounts of green, herbaceous vegetation and insects supplementing their diet when available. The preferred location for Tipton kangaroo rat burrows typically involves alluvial fans and flood plains and includes fine, highly alkaline sands and, to a lesser degree, alkaline sandy loams. Burrow systems are usually in open areas but may occur in areas of thick scrub. They are typically simple, but may include interconnecting tunnels. Most are less than 10 inches deep. They are commonly in slightly elevated mounds, the berms of roads, canal embankments, railroad beds, and bases of shrubs and fences where wind-blown soils accumulate above the level of surrounding terrain. Terrain not subject to flooding is essential for permanent occupancy by Tipton kangaroo rats.

Historical and Current Distribution. Tipton kangaroo rats inhabit saltbush scrub and alkali sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley. The historical geographic range of Tipton kangaroo rats was over 1.7 million acres. Distribution was limited to arid-land communities occupying the valley floor of the Tulare Basin in level or nearly level terrain. By 1985, the inhabited area had been reduced, primarily by cultivation and urbanization, to about 60 thousand acres, only about 4 percent of the historical acreage. Current occurrences are limited to scattered, isolated areas. In the southern San Joaquin Valley this includes the Kern National Wildlife Refuge, Delano, and other scattered areas within Kern County.

Density estimates range from 2.8 to 3.6 animals per acre. Habitat type and climatic conditions appear to play a role in density. For example, at the end of a 5 year drought in April 1991, populations erupted, peaking in January 1993. In April 1995, following a higher than average rainfall year, the populations declined. In 1997 the Service estimates that they now inhabit approximately 4 percent of their historic range (Service 1998d).

Reasons for Decline. The construction of dams and canals that made a dependable supply of water available and allowed the cultivation of the alkaline soils of the saltbush and valley sink scrub and relictual dune communities, was principally responsible for the decline and endangerment of the Tipton kangaroo rat. Widespread, unrestricted use of rodenticides to control California ground squirrels probably contributed to the decline or extirpation of small populations. Urban and industrial development and petroleum extraction all have contributed to habitat destruction. Except for small, isolated populations, predation is unlikely to threaten Tipton kangaroo rats. The increasing fragmentation of the range of Tipton kangaroo rats, however, increases the vulnerability of small populations to predation. Current threats of habitat destruction or modifications come primarily from industrial and agriculturally-related developments, cultivation and urbanization, and secondarily from flooding.

Recovery Actions. Recovery of the Tipton kangaroo rat is addressed in the Recovery Plan (Service 1998d). This plan calls for (1) research to determine how to manage natural lands to enhance habitat for Tipton kangaroo rats that lessens the frequency and severity of population

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crashes (2) consolidation and protection of blocks of suitable habitat to minimize the effects of random catastrophic events on their populations.

California Condor (*Gymnogyps californianus*)

Species Description and Life History. The California condor was federally listed as endangered on March 11, 1967 (32 FR 4001). Critical habitat was designated in Tulare, Kern, Los Angeles, Ventura, Santa Barbara, and San Luis Obispo Counties.

The California Condor is a member of the Cathartidae family or new world vultures. With a wing span of nearly 10 feet (3 meters) and weighing approximately 22 pounds (10 kilograms), it is one of the largest flying birds in the world, as well as one of the rarest. Adults are black except for white underwing linings and edges of the upper secondary coverts. The head and neck are mostly naked; the skin on the neck area is gray, grading into various shades of yellow, red, and orange on the head. Males and females cannot be distinguished by size or plumage characteristics.

Condors do not kill for food but feed on available carrion. The principal foraging regions used by condors since the late 1970s have been the foothills bordering the southern San Joaquin Valley and axillary valleys in San Luis Obispo, Santa Barbara, Kern, and Tulare Counties. Typically, foraging sites are in grasslands or oak-savannah regions at lower elevations, and roosting and nesting sites are located at higher elevations on cliffs. The important foraging areas are primarily private grazing lands. Condors nest in various types of rock formations including crevices, overhung ledges and potholes. They do not breed until they are about 6 years of age; they produce one egg per year or every other year in the wild.

Historical and Current Distribution. During the Pleistocene era (10,000 to 100,000 years ago) the California condor ranged from British Columbia, Canada to Baja California, Mexico and through the southwest to Florida and north to New York State. With the extinction of the large Pleistocene Era mammals, condors declined in range and numbers. Another large decline occurred when European settlers arrived on the West Coast; the decline accelerated during the gold rush of 1849. Condors were wantonly shot, poisoned, and eggs and birds were collected. By 1940 the condor's range was reduced to a horseshoe-shaped area in southern California that included the coastal mountain ranges of San Luis Obispo, Santa Barbara and Ventura Counties; a portion of the Transverse Range in Kern and Los Angeles Counties; and the Southern Sierras in Tulare County. Kern County was one of the principal foraging regions used by California condors from the late 1970s to 1987 until the wild birds were all captured for breeding stock. Condors foraged extensively in the foothills adjacent to the northern boundary of Los Padres National Forest, to Reyes Station in the west, to the Pleito Hills west of Interstate Highway 5, and eastward throughout much of the region from the Tehachapi Mountains north to the slopes of Cummings Mountain.

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Young birds raised in captivity have been reintroduced into the wild in western Monterey County, eastern San Luis Obispo County, and eastern Santa Barbara County in California, and near the Grand Canyon in Arizona.

Reasons for Decline. The California condor declined over the past century to such a low level that only 21 individuals existed in 1982. Reasons for decline include human persecution, egg collecting, pesticides, lead poisoning, and habitat loss. Since reintroduction five birds have died from colliding with power lines.

Recovery Actions. In 1981 a captive breeding program was established to provide captive-reared condors to release to the wild. The Service began reintroducing California condors to the wild in 1992, and as of September 1998, 34 birds in California and 24 birds in Arizona are being closely monitored in the wild. No birds have bred yet in the wild. Because of the deaths from contact with power lines, condors started undergoing power line aversion training in 1995 before their release. However, in 1997 two more condors died as a result of power line collisions (Service 1998a). The Service proposes to release 6 condors in the Wind Wolves Preserve in Kern County in 1999. The *Condor Recovery Plan* was revised in 1996.

Least Bell's Vireo (*Vireo bellii pusillus*)

Species Description and Life History. The least Bell's vireo was federally listed as endangered in May 2, 1986 (51 FR 16474) and state listed as endangered in 1980. Designated critical habitat for the least Bell's vireo includes the Santa Ynez River (Santa Barbara County), Santa Clara River (Ventura and Los Angeles Counties), Santa Ana River (Riverside and San Bernardino Counties), and Santa Margarita River, San Luis Rey River, Sweetwater River, San Diego River, Tijuana River, Coyote Creek, and Jumul-Dulzura Creeks (San Diego County).

The least Bell's vireo is a small gray, migratory passerine. The above is grayish ash; below is pure white with sometimes a faint suffusion of a light shade of brownish gray on the breast; sides under the wings are moderately tinged with sulphur yellow. It has a narrow, barely discernable eye ring; two faint white bars on each wing; dull white narrow margins on the outer border of the wings and tail; and an olive tinge on the tail (Terres 1995).

The least Bell's vireo is a sub-tropical migrant, traveling some 2,000 miles annually between breeding and wintering grounds. Little is known about the least Bell's vireo's wintering habitat requirements. Least Bell's vireos arrive on the southern California breeding grounds in mid-March to early April, with males arriving in advance of females by several days. Observations of banded birds suggest that returning adult breeders may arrive earlier than first year birds by a few weeks (Kus unpublished data). Least Bell's vireo are generally present on the breeding grounds until late September, although they may begin departing by late July. Stragglers have been noted in October and November (McCaskie and Pugh 1965; McCaskie 1969) and occasionally individuals overwinter in California (S. Laymon, personal communication, no date).

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Males establish and defend territories through counter-singing, chase and sometimes physical confrontation with neighboring males. Territory size ranges from 0.5 to 7.5 acres. Nest building commences a few days after pair formation (Pitelka and Koestner 1942, Barlow 1962). The majority of nests by far are placed in willows and mulefat.

Egg-laying begins one to two days after nest completion. Typically three to four eggs are laid, occasionally two, and rarely five. Average clutch size of non-parasitized nests observed with complete clutches has ranged from 3.1 to 3.9 during recent years. Adults continue to care for the young for at least two weeks after fledging, during which time territorial boundaries may be relaxed as family groups range over larger areas. Fledglings generally remain in the territory or its vicinity for most of the season, although the behavior of older fledglings produced early in the year has not been well studied.

The least Bell's vireo is a common host (Hanna 1928; Dawson 1923, Rowley 1930, Grinnell and Miller 1944, Goldwasser et al. 1980, Salata 1981) and readily accepts cowbird eggs, although it is a relatively poor host and does not fledge many cowbirds (Friedmann 1963). The tendency of male least Bell's vireo to sing from the nest no doubt enhances vulnerability to parasitism, although cowbirds evidently locate most nests by observing the pair during nest construction. In heavily parasitized areas, up to four cowbird eggs may be found in least Bell's vireo nests (Salata 1983).

Within the Lake Isabella vicinity upstream on the Kern River from Bakersfield, recent sightings on the South Fork of the Kern River suggest that the least Bell's vireo may be returning to this area. In May of 1992, a single unmated male was sighted in this area for six weeks during the breeding season. In 1994, a male least Bell's vireo was sighted in August, and another vireo was seen in December of 1995 (S. Laymon, personal communication, no date). During the 1996 breeding season, five least Bell's vireos were recorded using the South Fork of the Kern River. No breeding surveys have been conducted within the project area.

Historical and Current Distribution. Historically, the least Bell's vireo was widespread and abundant, ranging from interior northern California near Red Bluff (Tehama County), south through the Sacramento-San Joaquin Valleys and Sierra Nevada foothills, and in the Coast Ranges from Santa Clara County south to approximately San Fernando, Baja California, Mexico (Grinnell and Miller 1944). Populations also were found in the Owens Valley, Death Valley, and scattered oases and canyons throughout the Mojave Desert.

In 1973, no least Bell's vireos were found during an intensive search in formerly occupied habitat between Red Bluff, Tehama County, and Stockton, San Joaquin County (Gaines 1974). By the early 1980's, the vireo had been extirpated from the Sacramento and San Joaquin Valleys, once the center of its breeding range, and the species was restricted to two localities in the Salinas River Valley (Monterey and San Benito Counties; D. Roberson, personal communication), one locality along the Amargosa River (Inyo County), and numerous small populations in southern California south of the Tehachapi Mountains and in northwestern Baja California, Mexico

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(Gaines 1977, Goldwasser 1978, Goldwasser et al. 1980). By the time the least Bell's vireo was listed in 1986, the statewide population was estimated at 300 pairs, the majority of which were concentrated in San Diego County.

The entire known United States population in 1994 consisted of approximately 700 breeding pairs (Service 1995). In 1996 survey results showed an increase to approximately 1,300 pairs (Service 1997).

Least Bell's vireo are obligate riparian breeders, typically inhabiting structurally diverse woodlands along watercourses. They occur in a number of riparian habitat types, including cottonwood-willow forests, oak woodlands, shrubby thickets, and mulefat scrub. Several investigators have attempted to identify the habitat requirements of least Bell's vireo by comparing characteristics of occupied and unoccupied sites, and have converged on two features which appear to be essential: (1) the presence of dense cover within 3 to 6.5 feet of the ground, where nests are typically placed, and (2) a dense, stratified canopy for foraging (Goldwasser 1981; Gray and Greaves 1984; Salata 1981, 1983). Although least Bell's vireo typically nest in willow-dominated areas, plant species composition does not appear to be as important a determinant of nesting site selection as habitat structure.

The selection of breeding sites by least Bell's vireo does not appear to be limited to riparian stands of a specific age, although least Bell's vireo are characterized as preferring early successional habitat. Again, vegetation structure, more than simply age, appears to be the important determinant of site use. Early successional riparian habitat typically supports the dense shrub cover required for nesting, and also a structurally diverse canopy for foraging. If permitted to persist, willows and other species form dense thickets that, in approximately 5 to 10 years, become suitable vireo habitat (Goldwasser 1981). In mature riparian habitat, the understory vegetation often consists of species such as California wild rose (*Rosa californica*), poison oak (*Toxicodendron diversiloba*), California blackberry (*Rubus ursinus*), grape (*Vitis californica*), and a variety of perennials that provide concealment for vireo nests. In addition, vireo nest placement tends to occur in openings and along the riparian edge, where exposure to sunlight allows the development of shrubs.

Although least Bell's vireos are tied to riparian habitat for nesting, they have been observed extending their activities into adjacent upland habitats. The arid nature of the southern California landscape typically results in the close proximity of riparian and non-riparian habitats such as coastal sage scrub, and least Bell's vireo along the edges of riparian corridors are able to maintain territories that incorporate both habitat types. Kus and Miner (1989) found that least Bell's vireo along the Sweetwater River in San Diego County traveled 6 to 200 feet from the riparian edge to reach upland areas. Upland habitat was used primarily by foraging adults and adults foraging with fledglings; however, 35 percent of the pairs whose territories included non-riparian habitat placed at least one nest there.

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Reasons for Decline. Predation is responsible for the majority of nest failures, with most predation occurring during the egg stage. Predators are believed to include scrub jays (*Aphelocoma coerulescens*), Cooper's hawks (*Accipiter cooperii*), gopher snakes (*Pituophis melanoleucus*) and other snake species, raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), coyote (*Canis latrans*), long-tailed weasels, dusky-footed woodrats (*Neotoma fuscipes*), deer mice (*Peromyscus maniculatus*), rats (*Rattus spp.*), and domestic cats (*Felis domestica*) (L. Hays, personal communication 1996). Other sources of nest failure are human disturbance (trampling of nest or nest site; clearing of vegetation), and abandonment following cowbird parasitism, ant infestations, rainstorms, and unknown factors. Least Bell's vireo pairs may attempt as many as five nests in a breeding season, although most attempt only one or two.

The decline of this California land bird species has been attributed, in part, to the combined, perhaps synergistic effects of the widespread and relentless destruction of riparian habitats due to cattle grazing, farming, urban development, and water diversions for human activities, and brood-parasitism by the brown-headed cowbird (Salata 1986; Service 1986c; Garrett and Dunn 1981). Habitat loss and fragmentation continues to threaten the remaining least Bell's vireo populations in southern California and Baja California. These conditions make least Bell's vireo populations particularly vulnerable to local, and possibly range wide extinction (Wilcox 1980). Small populations are susceptible to catastrophic extinction, where the entire population could be adversely impacted as a result of stochastic events such as fire, flooding, as well as demographic failure, where the population fails to produce any or enough offspring to survive into the future. Large inter-population distances reduce the ability to disperse which is necessary for genetic exchange among populations, heightening the risk of deleterious inbreeding (Soule 1980; Conway 1980; Senner 1980). Lack of available habitat to serve as "refuges" during years when floods and other processes eliminate breeding sites poses a serious threat to the continued survival of the species.

Riparian habitat loss in the Central Valley, estimated at 95 percent of that present during the Gold Rush (Smith 1977), has resulted in near extirpation of the least Bell's vireo from an area that at one time supported 60 to 80 percent of the Statewide population. Riparian woodlands have been cleared primarily for agricultural purposes, rivers have been diked to prevent winter flooding of bottomlands, and dams built to impound water for agricultural, industrial, and domestic use. As a result, large amounts of least Bell's vireo breeding habitat has been inundated or removed. Flood control projects and channelization of rivers have further reduced available least Bell's vireo habitat. Livestock grazing destroyed the choice lower strata of vegetation preferred by the least Bell's vireo (Overmire 1962). Similar activities are responsible for the decline of riparian habitat in Baja California (Short and Crossin 1967). Grinnell and Miller (1944) considered the least Bell's vireo still "common, even locally abundant under favorable conditions of habitat". However, they noted that in the "last fifteen years a noticeable decline has occurred in parts of southern California and in the Sacramento-San Joaquin Valley".

Recovery Actions. Efforts were underway in 1986 to develop a series of Habitat Conservation Plans for the Sweetwater Reservoir/River, San Diego River, and San Luis Rey River.

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Development of these plans is being coordinated by the San Diego Association of Governments. A *Least Bell's Vireo Recovery Plan* was drafted in 1986 (Service 1986b).

Since the vireo was listed in 1986 and intensive cowbird removal programs initiated, the species has undergone an increase almost as dramatic as its decline. While a few populations surviving the decline have generally stabilized in size (e.g., the Sweetwater, San Diego, and Santa Ynez populations), most have undergone tremendous growth. For example, least Bell's vireo at the Santa Margarita River at Marine Corps Base Camp Pendleton (MCBCP) have increased in number from 15 males in 1980 (Salata 1980) to 348 in 1994 (Service 1995); similar increases have occurred at the Prado Basin on the Santa Ana River, where the vireo population grew from 12 males in 1985 (Service 1986c) to 188 in 1994 (Pike and Hays 1993), and at the Tijuana River, where the population expanded from 13 males in 1990 (Kus 1990) to 80 four years later (Kus 1994). Although a thorough range wide survey has not been conducted since the 1986-87 effort, available census data indicate that the vireo population in southern California has tripled over the last eight years.

Least Bell's vireos appear to be expanding their range and recolonizing sites unoccupied for years or decades. Expansion is occurring both eastward in San Diego County as birds become re-established in the more inland reaches of the coastal valleys, and northward as birds disperse into Riverside and Ventura Counties. Observations of color-banded birds at these sites reveal that dispersal from the more southerly breeding populations is partially responsible for the colonization. As populations continue to grow and least Bell's vireo disperse northward, it is anticipated they could reestablish in the central and northern portions of their historic breeding range.

Blunt-nosed Leopard Lizard (*Gambelia silus*)

Species Description and Life History. The blunt-nosed leopard lizard was federally listed as endangered on March 11, 1967 (32 FR 4001) and state listed as endangered in 1971. The blunt-nosed leopard lizard is a relatively large lizard of the family Iguanidae, with a long, regenerative tail; long, powerful hind limbs; and a short, blunt snout. Blunt-nosed leopard lizards are darker than other leopard lizards, and exhibit tremendous variation in color and pattern on the back. Background color ranges from yellowish or light gray-brown to dark brown depending on the surrounding soil color and vegetation association. The under surface is uniformly white.

Adult lizards often seek safety in burrows, while immature lizards use rock piles, trash piles, and brush. The lizards use burrows constructed by mammals, such as kangaroo rats, for overwintering and estivation. Adult lizards hibernate during the colder months of winter, and are less active in the hotter months of late summer. Adults are active above ground from about March or April through June or July. Hatchlings are active until mid-October or November.

Historical and Current Distribution. The blunt-nosed leopard lizard was distributed historically throughout the San Joaquin Valley and adjacent interior foothills and plains, extending from

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central Stanislaus County south to extreme northeastern Santa Barbara County. The blunt-nosed leopard lizard prefers open, sparsely vegetated areas of low relief and inhabits valley sink scrub, valley saltbush scrub, valley/plain grasslands, and foothill grasslands vegetational communities.

Reasons for Decline. Lizard habitat has been significantly reduced, degraded, and fragmented by agricultural development, petroleum and mineral extraction, livestock grazing, pesticide application, and off-road vehicle use. Today its distribution is limited to scattered parcels of undeveloped land, with the greatest concentrations occurring on the west side of the valley floor and in the foothills of the Transverse Range.

Recovery Actions. A recovery plan was first prepared in 1980 and revised in 1985 (Service 1985). The multi-species Recovery Plan issued by the Service in 1998 replaces the 1985 plan. The recovery strategy requires that the Service (1) determine appropriate habitat management and compatible land uses for the blunt-nosed leopard lizard; (2) protect additional habitat for them in key portions of their range; and (3) gather additional data on population responses to environmental variation at representative sites in their existing geographic range (Service 1998d).

Hoover's eriastrum (*Eriastrum hooveri*)

Species Description and Life History. Hoover's eriastrum was federally listed as threatened on July 19, 1990 (55 FR 29361). Hoover's eriastrum is an inconspicuous member of the phlox family (Polemoniaceae). The wiry stems of this species may or may not branch and vary in height from 1 to 20 centimeters (0.4 to 8 inches) at flowering. The leaves are thread-like and may have two narrow lobes near the base. Hoover's eriastrum has tiny white to pale blue flowers that are nearly hidden in tufts of woolly hair. The stamens are shorter than the corolla (Service 1998d).

Hoover's eriastrum grows in scrub-grassland habitats with moderate cover of saltbush. It often grows among cryptogamic soil crusts (i.e., mats of moss, lichen, and algae) that reduce competition from annual grasses (Taylor and Davilla 1986).

Historical and Current Distribution. Hoover's eriastrum was historically distributed in the Temblor Range (Kern and San Luis Obispo Counties), Cuyama Valley (San Luis Obispo and Santa Barbara Counties), and discontinuously in the San Joaquin Valley from Fresno County south, excluding the vicinity of Tulare Lake. The present distribution still extends from Bridge Road west of Fresno to near Cuyama in Santa Barbara County (Taylor and Davilla 1986). Hoover's eriastrum was reported to exist at 130 sites in 1990 (Service 1990) and additional populations may yet be found. Field surveys conducted throughout the southern San Joaquin Valley by Federal agencies and private consultants since 1992 have documented numerous occurrences of Hoover's eriastrum (BLM 1992; BLM 1994). Surveys have shown that Hoover's eriastrum populations range from the upper Cuyama Valley near Ventucopa, Santa Barbara County, northward to the Panoche Hills in San Benito County, a distance of approximately 140 miles. Hoover's eriastrum occurs in 42 U.S. Geological Survey 7.5 minute quadrangles within Kings, Kern, San Luis Obispo, Santa Barbara, San Benito, and Fresno counties. Hoover's

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eriastrum occurrence primarily are located within four areas. The four areas from largest to smallest are: (1) the Kettleman Hills area, (2) the Carrizo Plain-Elkhorn Plain-Temblor Range-Caliente Mountains-Cuyama Valley-Sierra Madre Mountains area, (3) the Lokern-Elk Hills-Buena Vista Hills-Coles Levee-Maricopa-Taft area, and (4) the Antelope Plain-Lost Hills-Semitropic area. Additional, more isolated, populations occur throughout the region. Hoover's eriastrum is now known from Fresno, Kings, San Luis Obispo, and Santa Barbara Counties at scattered locations spanning a distance of 100 miles in the inner southern Coast Range of central California. Recently, approximately 20,000 acres of 47,000 acres of Naval Petroleum Reserve No. 1 (part of area 3) in Kern County burned. Hoover's eriastrum is expected to recover in the burned areas (Brian Cypher personal communication 1997).

Reasons for Decline. Hoover's eriastrum has declined mainly as a result of habitat conversion to agricultural and urban uses. An estimated 92% of known extant populations are threatened by future conversions to agricultural use, groundwater recharge basins, and oil and gas development (Taylor and Davilla 1986). Although some sites contain substantial populations (5,000-40,000 individuals), most of the remaining sites on the valley floor are at risk because they are isolated from one another, range in size from approximately 1 acre to less than 400 acres, and contain fewer than 1,000 individuals (Service 1990).

Recovery Actions. Recovery of the species is addressed in the *Recovery Plan*. Several populations are protected at TNC's Paul Paine Preserve and CDFG's Alkali Sink Ecological Reserve. Some protection is afforded to known populations on Federal lands administered by BLM and U.S. Department of Energy.

California Jewelflower (*Caulanthus californicus*)

Species Description and Life History. California jewelflower was federally listed as endangered on July 19, 1990 (55 FR 29361). California jewelflower is an annual herb of the mustard family (Brassicaceae). Its stems are erect, up to about 1 foot tall, and produce several flowering branches. The leaves are wavy-margined and most are in a basal rosette. The flowers are translucent white with purple to green tips. Fruit, stem, and foliar hair characteristics distinguish this species from other jewelflowers.

California jewelflower occurs in grassland and mixed grassland-scrub habitats, often on sandy soils. All of the previously known and recently discovered populations occur in remnants of mixed native/non-native grassland habitat.

Historical and Current Distribution. California jewelflower is endemic to the southern San Joaquin Valley region. It originally occurred throughout much of the Tulare Basin from Coalinga and Fresno in Fresno County to the Cuyama Valley in Santa Barbara County and Bakersfield in Kern County. Historical collections document its occurrence at 47 sites and an early collector described the plant as "abundant on the plains of the San Joaquin from Tulare southward" (Taylor and Davilla 1986; Service 1990).

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In 1990, California jewelflower was known to occur at only 10 populations, primarily in three areas: the mouth of Santa Barbara Canyon in Santa Barbara County, the southern portion of the Carrizo Plain in San Luis Obispo County, and at TNC's Paul Paine Preserve in Kern County (a small colony of introduced plants). Since 1990, several more populations have been discovered following wet winters (Skinner and Pavlik 1994; CDFG 1993; Service 1990).

Reasons for Decline. Habitat loss resulting from agricultural land conversion, increased livestock grazing and trampling associated with the development of summer water sources, oil and gas development, other human activities, and competition with aggressive non-native annual grasses probably eliminated California jewelflower from Fresno, Kings, and Tulare Counties and reduced its range in Kern and Santa Barbara Counties. These factors continue to threaten many of the remaining populations (Taylor and Davilla 1986; Service 1990).

Recovery Efforts. California jewelflower was federally listed as endangered on July 19, 1990 (Service 1990). Several populations are protected at the Carrizo Plain Natural Area through a cooperative effort between the CDFG, U.S. Bureau of Land Management (BLM), and The Nature Conservancy (TNC). CDFG has entered into a memorandum of understanding with the University of California at Berkeley to study the taxonomy of the plant (CDFG 1992). This species is addressed in the *Recovery Plan*.

Kern Mallow (*Eremalche kernensis*)

Species Description and Life History. Kern mallow was federally listed as endangered on July 19, 1990 (55 FR 29361). Kern mallow was first described as *Eremalche kernensis* (Wolf 1938). The most recent treatments (Bates 1992, 1993) assign Kern mallow the name *Greene* ssp. *parryi*. Bates' treatment of Kern mallow, which includes both white- and purple-flowered gynodioecious plants, has not widely been accepted by the scientific community. Due to the debate within the scientific community over the newest treatment, the Service intends to undertake a status review to solicit available scientific information on which to base a determination of the appropriate taxonomic circumscription of Kern mallow. In the interim, the Service will continue to consider the listed entity to be *E. kernensis* C.B. Wolf, which was the circumscription used when Kern mallow was listed in 1990 (Service 1990). The endangered Kern mallow is a small annual herb of the mallow family 2 to 4-inches in height primarily with white flowers.

Historical and Current Distribution. Kern mallow is restricted to the eastern base of the Temblor Range, occurring from the vicinity of McKittrick to near Buttonwillow within valley saltbush scrub in Kern County (Taylor and Davilla 1986).

Several suspected populations of Kern mallow have been identified on DOE-administered NPR-2 lands. One population of Kern mallow was found in Section 18H during plant surveys conducted in the spring of 1993. The plants were found growing in alkali soils in association with inkweed and annual saltbush species. Kern mallow also has been observed in Sections 18B, 20B, 28B, 8D, and 32G of the former Naval Petroleum Reserve-1 (DOE and Chevron 1994).

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Reasons for Decline. The species is threatened by oil and gas development, transmission line maintenance or expansion, agricultural conversion, overgrazing by livestock, exotic plant competition, and off-road vehicle use.

Recovery Actions. Recovery of Kern mallow is addressed in the *Recovery Plan*. The top-priority task for recovery is to protect 90 percent of the remaining occupied habitat. Other high priority tasks include continuing demographic and ecological research on the species.

San Joaquin Woolly-threads (*Lembertia congdonii*)

Species Description and Life History. San Joaquin woolly-threads was federally listed as endangered on July 19, 1990 (55 FR 29361). San Joaquin woolly-threads is an annual herb. A member of the sunflower family, San Joaquin woolly-threads produces several frequently branching stems arising from the base. These white-woolly stems grow about 10 inches in length and often trail on the ground. The leaves are about 1/4 inch wide and about 1 1/2 inches long, and have uneven, wavy margins. The flowers, which begin to bloom in late February, are small, have a yellow center, lack rays and are about 1/4 inch in diameter. The presence of dimorphic achenes (one-seeded indehiscent fruit) separate it from its closest relative, *Eatonella nivia*, which has only one type of achene.

Little is known of the habitat preferences of San Joaquin woolly-threads. It appears to favor non-alkaline soils of sandy or silty sand texture and an arid climatic regime (Taylor 1987). San Joaquin woolly-threads is associated with valley saltbrush scrub, and valley and foothill grasslands.

Historical and Current Distribution. The San Joaquin woolly-threads was first collected in 1883. Only 12 populations of San Joaquin woolly-threads remain in the San Joaquin Valley and adjoining foothills from the vicinity of Panoche Pass southeasterly to Caliente Creek east of Bakersfield. Another seven populations occur to the southwest in the Cuyama Valley and Carrizo Plain.

Reasons for Decline. Thirty-three populations or 63 percent of the 52 historical populations of the species have been lost. Conversion of grassland sites to agriculture, urbanization, gravel and sand extraction, oil and gas development, continued overgrazing, and off-road vehicle use threaten the remaining stands of San Joaquin woolly-threads.

Recovery Efforts. Recovery of San Joaquin woolly-threads is addressed in the *Recovery Plan*. The top-priority task is to protect existing habitat in the San Joaquin Valley.

Bakersfield Cactus (*Opuntia basilaris* var. *treleasei*)

Species Description and Life History. Bakersfield cactus was federally listed as endangered on July 19, 1990 (55 FR 29361). Bakersfield cactus is a succulent, spiny member of the cactus

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family (Cactaceae). It is a spreading perennial plant with gray-green stems that form flat pads or "joints". It has large, showy, magenta flowers that bloom from March through June. It is a close relative of the familiar beavertail cactus of the southern California deserts. Bakersfield cactus is a distinct member of the beavertail group that is endemic to the southern Tulare Basin in Kern County (Service 1990). Bakersfield cactus occurs in grassland on bluffs, low hills, toe slopes, drainages, and flats. It prefers substrates of coarse cobble and well-drained sand.

Historical and Current Distribution. Bakersfield cactus once formed extensive colonies around Bakersfield, along the bluffs of the Kern River, along the Caliente Creek drainage and nearby foothills of the Tehachapi Mountains, and south to the Tejon Hills. Its current distribution is very fragmented and much reduced, with remnant populations in five areas: the oilfields northeast of Oildale, Kern River bluffs northeast of Bakersfield, the bluffs and rolling hills west of north Caliente Creek east of Bakersfield, Comanche Point on the Tejon Ranch southeast of Arvin, and northwest of the community of Wheeler Ridge (Service 1990).

Reasons for Decline. A substantial decline of this species has resulted from urbanization, agricultural conversion (primarily for citrus groves and row crops), oilfield development, overgrazing, dumping, sand mining, and invasion of weedy grasses (CDFG 1992). These activities plus ORV use, telecommunication and electrical line construction, and proposed flood control basins continue to threaten the remaining sites (Service 1990). Agricultural conversion remains the most pervasive threat to this species.

Recovery Actions. Recovery of the cactus is addressed in the *Recovery Plan*. A few of the remaining populations are protected at The Nature Conservancy's Sand Ridge and Paine Preserves.

Environmental Baseline

This section contains an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species and their habitats addressed in this biological opinion within the action area of the proposed project. The action area of the proposed project is generally northwest Kern County. The effects of the proposed project are addressed in the following section and are not included here.

Human activities that have led to the current status of native species in the San Joaquin Valley include farming, oil and mineral exploration and extraction, urban development, pesticide applications, off-road vehicle use, and construction of transportation, communications, and irrigation infrastructures. Between 1870 and 1985 more than 94 percent of the wild lands on the San Joaquin Valley floor were converted to uses that make them unsuitable for wildlife or plants (Service 1985).

These human activities can be linked to subsidized imported water and population growth in the San Joaquin Valley. Completion of the San Luis Unit of the Central Valley Project and the

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California Aqueduct of the State Water Project resulted in rapid cultivation and irrigation of wild lands along the west side of the San Joaquin Valley (Service 1998d). The population of Kern County is expected to double between 1987 and 2010, from 286,000 people to 567,500 people. This population will occupy an additional 34,000 acres for houses and 10,500 acres for commercial and industrial uses. (City of Bakersfield 1990). Therefore the pressure to develop remaining wild land parcels will grow.

San Joaquin Kit Fox. Loss and degradation of habitat by agricultural, industrial, and urban developments and associated practices continue to affect San Joaquin kit fox. Loss of habitat contributes to kit fox declines through displacement, direct and indirect mortalities, barriers to movement, and reduction of prey. The isolation of remaining habitat fragments coupled with habitat degradation and barriers to movement, such as aqueducts and busy highways, can limit dispersal, and threaten survival of kit fox populations (Service 1998d).

The west side of the Kern County valley floor area harbors some of the highest densities of kit fox. However, population monitoring of San Joaquin kit fox at the Naval Petroleum Reserve on the west side of Kern County, in the hills, indicate a general downward trend in foxes captured from 1981 to 1996, as shown in Table 3. EG&G captured more than 50 individual foxes in 1981, 1982, and 1994. Thirty three foxes were captured in 1995, and 24 foxes were captured in 1996. Reasons for the decline are not fully understood and are probably complex. The decrease in fox captures from 1995 to 1996 may be caused in part by a decrease in the abundance of kangaroo rats, other rodents, and lagomorph prey species, possibly depressing overall reproductive success and survival (Otten 1997).

Elsewhere, occurrences are more fragmented. Some kit foxes have managed to find foraging and denning habitat within the City of Bakersfield, especially along the Kern River.

Tipton Kangaroo Rat. During and following the 1994-1995 winter, biologists noted a decline in abundance of kangaroo rats in the southern San Joaquin Valley. Lower than expected trapping results, and decreased sign of activity were observed at several dispersed sites. Dramatic declines were noted for short-nosed, Tipton, and Heermann's kangaroo rats, although only modest reductions were noted for giant kangaroo rat populations on the valley floor (Single et al. 1996).

California Condor. The California condor roosts and nests in higher elevation areas on cliffs, and forages across hilly lower elevation areas. Condors from San Luis Obispo and Santa Barbara Counties have been seen in Taft in Kern County, at the edge of the coastal mountains (Mitchell personal communication 1998). The birds in Santa Barbara and San Luis Obispo counties, and the birds proposed for reintroduction in the Wind Wolves Preserve in southern Kern County in early 1999, will forage in the foothills west of Interstate 5 in Kern County, but are not likely to venture out onto the Valley floor east of Interstate 5, where the proposed project is located. Foraging habitat for the California condor has been lost to oil development, urban development, and row crops (Service 1998a).

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Least Bell's Vireo. The least Bell's vireo has been seen in Kern County in recent years, but more information is needed about their status. Least Bell's vireos primarily inhabit dense, willow-dominated riparian habitats with lush understory vegetation. Most riparian habitat in Kern County has been eliminated due to water diversions for agriculture, industry, and urban uses.

Blunt-nosed Leopard Lizard. In Kern County the blunt-nosed leopard lizard currently occupies scattered parcels of undeveloped land on the Valley floor, and occurs in the foothills of the Coast Range. While the blunt-nosed leopard lizard can occupy grassland used for grazing it prefers lands with scattered shrubs and sparse grass/forb cover. Habitat for the blunt-nosed leopard lizard has been lost to oil development, urban development, and row crops (Service 1998d).

In recent years, above average precipitation seems to have increased the amount of vegetative cover. This increase in cover may be a factor in the low abundance of adult lizards seen during the population monitoring at the Naval Petroleum Reserve in Western Kern County, in 1995 (DOE and Chevron 1996).

Hoover's Eriastrum. Hoover's eriastrum exists on some remnants of native habitat in western Kern County. Valley floor populations of Hoover's eriastrum have been destroyed primarily by farming operations and secondarily by urban development. Occurrences of the plant in the Bakersfield metropolitan area are threatened by development. Hoover's eriastrum was found during surveys for this project on a parcel south of the proposed project footprint, east of the Southern Pacific Railroad, and north of the Cross Valley Canal. The population identified during surveys for this project is part of the Lokern-Elk Hills-Buena Vista Hills-Coles Levee-Maricopa-Taft area population. Conversion of land from native habitat or grazing to row crops continues to threaten Hoover's eriastrum populations in western Kern County (Service 1998d).

California Jewelflower. Habitat loss resulting from agricultural land conversion, increased livestock grazing and trampling associated with the development of summer water sources, oil and gas development, other human activities, and competition with aggressive non-native annual grasses probably eliminated California jewelflower from Fresno, Kings, and Tulare Counties and reduced its range in Kern and Santa Barbara Counties. These factors continue to threaten many of the remaining populations (Taylor and Davilla 1986; Service 1990). The California jewelflower was not found in the footprint or near the proposed project during Caltrans botanical surveys. One known population in the project action area has already been extirpated.

Kern Mallow. Kern mallow is known from a single metapopulation consisting of intermittent occurrences within an area of approximately 40 square miles at the eastern base of the Temblor Range in western Kern County to the west of Interstate 5 around Lokern Road. Kern mallow was found during surveys for this project on a parcel south of the proposed project footprint, east of the Southern Pacific Railroad, and north of the Cross Valley Canal. Oil field development and agricultural uses continue to threaten the existence of Kern mallow (Service 1998d).

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San Joaquin Woolly-threads. San Joaquin woolly-threads exists on some remnants of native habitat and grasslands in western Kern County near the Kern River east of Interstate 5 and near Lost Hills. Valley floor populations of San Joaquin woolly-threads have been destroyed primarily by farming operations and secondarily by urban development. Occurrences of the plant in the Bakersfield metropolitan area have mostly been extirpated, and the rest are threatened by development. Conversion of land from native habitat or grazing to row crops continues to threaten San Joaquin woolly-threads populations in western Kern County (Service 1998d).

Bakersfield Cactus. Bakersfield cactus occurs in grassland on bluffs, low hills, toe slopes, drainages, and flats. It prefers substrates of coarse cobble and well-drained sand. Most of the remaining Bakersfield cactus occurs to the north and east of downtown Bakersfield, or south of the proposed project action area near the intersection of 5 and 99, and not to the west in the proposed project area. Substantial decline has resulted from urbanization, agricultural conversion (primarily for citrus groves and row crops), oilfield development, overgrazing, dumping, sand mining, and invasion of weedy grasses (CDFG 1992). These activities plus off road vehicle (ORV) use, telecommunication and electrical line construction, and proposed flood control basins continue to threaten the remaining sites (Service 1990). Agricultural conversion remains the most pervasive threat to this species.

Effects of the Proposed Action

The effects of the proposed action are presented here. For the effects analysis, the Service has divided the project into the following components:

1. Adding a Limited Access Highway in West Kern County
2. Acquiring and Maintaining a Transit Corridor
3. Compensating for Adverse Effects on Endangered Species
4. Building the Highway
5. Using the Highway
6. Maintaining the Highway

The direct and indirect effects of each component will be described as they apply to federally-protected animal and plant species. The following section will address cumulative effects.

Adding a Limited Access Highway in Northwest Kern County

Direct Effects. Direct effects to animals and plants of building a new highway in Northwest Kern County include: impacts to the Kern Water Bank; habitat losses for animal and plant species on the proposed transit corridor; and restrictions to animal movements through the area.

The Kern Water Bank (KWB), in addition to its groundwater recharge functions, is an existing project that protects endangered species. The KWB is part of a complex of protected species preserves which includes the Elk Hills Conservation Area and the Coles Levee Ecosystem

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Preserve, as shown on Figure 7. The selected alternative is routed across KWB land, most of which is presently in use as recharge basins, as shown on Figure 8. The portion of the KWB that lies under and to the north of the proposed project, the North Basins, is approximately 650 acres in size (Cheryl Harding, personal communication 1998); approximately 400 acres are used as recharge basins and approximately 200 acres are designated as "compatible habitat" in the Kern Water Bank Habitat Conservation Plan (KWB HCP) (Kern Water Bank Authority 1997).

Compatible habitat is defined as previously farmed lands that are known to support protected species, and that are being managed to enhance their habitat value. "Sensitive habitat", as defined in the KWB HCP, is land area where remnants of saltbush scrub or sink scrub communities are present. None of the 600 acres is presently designated as "sensitive habitat" in the KWB HCP. The conservation bank portion of the KWB is located about three and a half miles south of the proposed project area, on the south side of the Kern River. The proposed project will provide a second and larger barrier, in addition to the Cross Valley Canal, to movement of San Joaquin kit foxes, blunt-nosed leopard lizards, and Tipton kangaroo rats between the 600 acre portion and the rest of the KWB. The road will impede local movements between populations and relocation or recolonization of species, which is a mechanism that allows populations to persist during cyclical changes in climate, natural catastrophes or other disturbances.

The selected alternative is routed across KWB land that supports recharge basins. Approximately 5 percent of the route is designated as compatible habitat. The recharge basins affected by the project are slated to be flooded frequently (KWBA 1997), making them less usable as habitat by upland protected species than if they were only flooded occasionally.

Habitat losses in acres from the selected alternative and proposed conservation ratios are presented on Table 1 for various types of habitat. The information about the Kern River alignment in that Table is no longer relevant and can be ignored.

East of the Southern Pacific Railroad, and between the proposed project and the Cross Valley Canal, is a small area, of undetermined size, where Caltrans found San Joaquin bluecurls (*Trichostema ovatum*) (no status), Hoover's eriogonum, and Kern mallow. This area is not in the path of the proposed project and, therefore, will not be directly affected by the project.

The effects of the project on animal movement across the project are negative, but unquantifiable. The effects of the project on animal movement between the northern 600 acres and the rest of the KWB have been mentioned. The highway project will also affect the movement of blunt-nosed leopard lizards, Tipton kangaroo rats, and San Joaquin kit foxes in other portions of the proposed project. Non-native grassland and the Kern River corridor can support and serve as a movement corridor for the protected species just mentioned. The occurrence of grassland next to the proposed project corridor is shown on Figure 9. The grassland areas occur in four locations: to the west of Interstate 5 in the footprint of the proposed interchange with the selected alternative; in the area near Enos Lane, in the area near Renfro and Allen Roads; and in the area between 99 and Coffee Road. In the three areas east of Interstate 5 the proposed project would fragment habitat for these three species and limit movement across the highway. Foxes, lizards and

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kangaroo rats will be deterred by noise, lights and the movement of cars, or they will die from colliding with vehicles.

The effects of the proposed project on kit fox movements will be discussed from east to west. The proposed highway will be elevated where it crosses the river and for a short distance on the north side of the river, and therefore will not block kit fox travel directly in the river corridor. However, the reduced cover from the lack of plants under a new bridge will reduce the habitat value of the river corridor to animals, including kit foxes. Caltrans proposes to install three 2-foot-diameter culverts underneath the freeway near the crossing of Mohawk Street, with exact locations to be determined by local kit fox experts, the Service, and CDFG. The placement of culverts under roads for use by kit foxes has not been adequately studied to determine its effectiveness and how it should be implemented.

Caltrans proposes to leave existing corridors along the Friant-Kern Canal and Coffee Road unobstructed to allow for their continued use by kit fox. Again, the existence of the bridge will reduce the amount of cover because of the lack of plants under the bridge, and reduce the value of the existing corridors for kit fox travel. Caltrans does not propose to install any culverts for kit foxes between Coffee Road and Calloway Drive due to the limited habitat in the area and expert advice that no north-south kit fox corridors exist in this 1.5-mile stretch of the proposed alignment (Caltrans 1998). The Service does not have enough evidence to agree or disagree with this assertion. Between Calloway Drive and Route 43 (Enos Lane) no accommodations for kit fox travel corridors are planned. From aerial photographs provided by Caltrans it is apparent that there is extensive agricultural land and grassland north and south of the proposed project between Calloway Drive and Route 43. Figure 8 shows that there are two areas of grassland in this stretch of the proposed project, and these would be areas where kit fox might den. The lack of kit fox culverts under the proposed project could be detrimental to kit foxes using the area. In the final segment of the selected alternative, from Route 43 to Interstate 5, Caltrans proposes to install ten 2-foot-diameter culverts evenly-spaced along the proposed project. Most of this segment is within the boundaries of the KWB. The use of fences to guide kit fox to culverts installed for their use, and limit their travel across the freeway, has been tried in other locales by Caltrans. It's effectiveness is unknown. No such fences are mentioned in the project description provided by Caltrans and FHWA.

Indirect Effects. Indirect effects to animal and plant species that are federally listed include effects from residential, commercial, and industrial projects that will be constructed in Northwest Bakersfield because transportation has improved. The effects of those projects that are within the planning area of the *Metropolitan Bakersfield 2010 General Plan (General Plan)* on nine species have been addressed by the Service in the Biological Opinion (Service 1994) for the Metropolitan Bakersfield HCP (City of Bakersfield 1994). To the northwest of Bakersfield the planning area boundary is a quarter mile west of Route 43 (Enos Lane) and a quarter mile north of Seventh Standard Road. The species addressed are:

- blunt-nosed leopard lizard,

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- Tipton kangaroo rat,
- San Joaquin kit fox,
- Hoover's eriastrum,
- California jewelflower,
- Kern mallow,
- San Joaquin woolly-threads, and
- Bakersfield cactus.

Take of the animal species listed above is authorized under the Metropolitan Bakersfield HCP. The City of Bakersfield and Kern County are buying endangered species habitat mostly in pre-approved areas to the northeast and southwest of the metropolitan Bakersfield area to compensate for losses within the planning area. Because these pre-approved purchase areas are not in the project vicinity, the indirect effects from the proposed project will not conflict with the Metropolitan Bakersfield HCP efforts to protect endangered species habitat.

The *General Plan* is based on a projected population growth from 286,000 people in 1987 to 567,000 people in 2010 in the Bakersfield metropolitan area. The easternmost segment of the proposed project would alleviate some or all of the congestion near Route 99 shown on Figure 4. The *General Plan* delineates proposed highways, including an east-west road in the northwest sector that mirrors the proposed project, and a north-south highway to the west of Bakersfield at about Allen Road, as shown on Figure 5. The *General Plan* is constructed to accommodate growth in the planning area. Kern County west of the planning area (essentially west of Enos Lane) is not zoned for development. The public policy, as contained in the various planning instruments, is to keep growth mostly inside the *General Plan* planning area. Of course, zoning can be changed in the future. The Service finds that the proposed project is consistent with existing plans for expansion of the Bakersfield metropolitan area, and those effects on endangered and threatened species within the planning area have been previously addressed by the Service.

Development west of the *General Plan* planning area due to the construction of the proposed project will affect endangered and threatened species and those effects have not yet been addressed. Natural lands west of Enos Lane will be developed for housing, commercial, and industrial purposes because of the improved infrastructure. Agricultural land may move from grazing to row crops as land values rise. Conversion of grazing land to row crops does not require local permits, but does require authorization from the Service. Such authorization is rarely sought, and therefore effects on endangered species are not often addressed. Any development projects will require Kern County Planning Department review, and standard Service policies for avoidance and conservation measures will be required as part of the local agency review process. Effects from agriculture, industry, and oil activities could be addressed through the Kern County Valley Floor Habitat Conservation Plan (KCVF HCP), which is in development (Cross personal communication 1998). The KCVF HCP will not allow conversion of agricultural land to urban uses if the conversion to agricultural from native habitat was illegal. No interchanges are planned west of Enos Lane. However, Enos Lane is on the edge of the *General Plan* planning area, and development will occur outside the planning area because of the Enos Lane access to the highway.

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Acquiring and Maintaining a Transit Corridor

Once the highway is conceptually designed and environmental approvals are obtained, the next step is to buy land for the highway right-of-way. Land purchases will occur in stages as money becomes available to Caltrans for the project. Once the land for a particular segment is bought Caltrans may take several years before building that portion of the highway. Animal species such as kit fox, blunt-nosed leopard lizard and kangaroo rats can benefit temporarily if the land is managed to benefit wildlife. The project description does not include information about how the land will be managed. No temporary benefits will accrue to endangered or threatened plants as none were found in the direct path of the proposed project.

Compensating for Adverse Effects on Endangered Species

Conservation measures proposed as part of the project description generally meet Service minimum requirements for each of the animals addressed. However, Service policy is that projects on the KWB are to be mitigated at a higher ratio than is used elsewhere in Kern County because the land has already been set aside for endangered species protection. The conservation ratio for setting aside land for projects on the KWB is 4 to 1 for permanent projects. Therefore the conservation acreage proposed by Caltrans for the portion of the project on KWB lands does not compensate for the full effects of the project. Additionally, the Caltrans project description does not include endowment or management funds for proposed conservation acres.

Accommodations for kit fox travel corridors have been proposed by Caltrans, but the utility and appropriateness of installing culverts, the effectiveness of two-foot-diameter culverts, and the spacing of culverts has not been sufficiently studied or proven. In addition, not enough is known about the movement of kit foxes within the Metropolitan Bakersfield planning area to determine the magnitude of the adverse effect of the highway on kit fox movement and dispersal. No accommodation for kit fox travel is proposed for the project between Calloway Drive and Route 43 (Enos Lane).

The proposed conservation concepts presented in Table 1 as part of the Project Description do not meet Service minimum requirements in two areas. First, burrowing owls are protected by the Migratory Bird Treaty Act (MBTA), and relocating burrows of owls may not be allowed under the MBTA. Second, blunt-nosed leopard lizard are most active above ground from April 15 to June 30 and August 1 to September 15. In order to time construction to avoid or minimize impacts, construction should occur from April 15 to June 30 and August 1 to September 15 (CDFG 1990).

Building the Road

The described project is designed to minimize and avoid most effects from construction of the road. Caltrans proposes to provide a project-specific conservation plan to address construction-related special status species impacts when the details of the project are better defined. Some aspects of the construction-related conservation measures go beyond the minimum Service

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requirements, such as conducting kit fox den surveys 2 years prior to construction in order to plan around existing dens as much as possible, and construction of artificial dens on appropriate nearby land to replace dens that cannot be avoided. Not all extant Service minimum requirements are listed in the project description, and no reference is made to Service minimum requirements.

Disturbance Effects on Listed Plant Species. The proposed project will not directly affect the listed plant species covered under this biological opinion as they do not presently occur in the footprint of the project.

Disturbance Effects on San Joaquin Kit Foxes. The likelihood of direct mortality to kit foxes from either crushing or entombment in dens is medium to low because of avoidance measures proposed in the project description. Not all avoidance measures required by the Service are mentioned in the project description. Kit fox may be adversely affected by vehicle strikes, and harassment from noise and vibration. Kit foxes may be adversely affected by construction activities temporarily blocking north-south travel corridors in urban Bakersfield as well as in the grassland and agricultural areas in the center and west portions of the project.

However, San Joaquin kit foxes inhabiting the project area and surrounding vicinity (for purposes of this biological opinion the surrounding vicinity is described as 500-feet outside and adjacent to the project footprint) may be subject to indirect effects including temporary harassment from noise associated with project activities and human presence, and a reduction in natural food sources as a result of habitat disturbance. Harassment can also result from heavy equipment vibration causing the collapse of dens and subsequent displacement of resident animals. The effects of harassment on kit foxes could be considered significant if construction activities were to occur in the vicinity of natal dens during winter months when they breed, and/or spring months when they whelp. Caltrans has specifically described avoidance measures to reduce the effects of the project on kit foxes from January 1 to June 14 of each year. Habitat compensation measures are anticipated to offset habitat loss due to project implementation.

Disturbance Effects on Blunt-nosed Leopard Lizards, and Tipton Kangaroo Rats. Blunt-nosed leopard lizards, and Tipton kangaroo rats may be adversely affected by vehicle strikes, entombment in burrows, and harassment from noise and vibration. These three species are only likely to be present in the three portions of the project that support grassland and in any adjacent agricultural fields. Caltrans will provide a biological monitor who can remove individuals from harms' way or allow them to escape unimpeded. Habitat compensation measures are anticipated to offset habitat loss due to project implementation.

Disturbance Effects on California Condor. The California condor is not likely to be adversely affected by construction activities on the project site. The foothills of the coastal range are approximately 4 miles west of the closest part of the proposed project. Condors forage over the foothills, but not over the valley floor. However, there is a small risk to condors foraging near the proposed project from electrocution if power lines are built into the foothills of northwest Kern County because of development that follows the road.